

ABSTRACT

A covered substrate is described, which comprises: (a) a flexible substrate layer; and (b) a plurality of cooperative barrier layers disposed on the substrate layer. The plurality of cooperative barrier layers further comprise one or more planarizing layers and one or more high-density layers. Moreover, at least one high-density layer is disposed over at least one planarizing layer in a manner such that the at least one high-density layer extends to the substrate layer and cooperates with the substrate layer to completely surround the at least one planarizing layer. When combined with an additional barrier region, such covered substrates are effective for enclosing organic optoelectronic devices, such organic light emitting diodes, organic electrochromic displays, organic photovoltaic devices and organic thin film transistors. Preferred organic optoelectronic devices are organic light emitting diodes.